

ZXMN2A03E6

20V N-CHANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=20V$; $R_{DS(ON)}=0.055\Omega$ $I_D=4.5A$

DESCRIPTION

This new generation of TRENCH MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package

APPLICATIONS

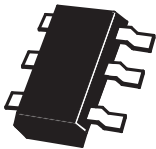
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

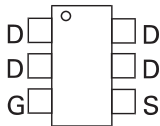
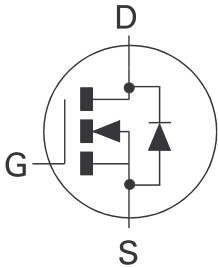
| DEVICE | REEL SIZE | TAPE WIDTH | QUANTITY PER REEL |
|--------------|-----------|------------|-------------------|
| ZXMN2A03E6TA | 7" | 8mm | 3000 units |
| ZXMN2A03E6TC | 13" | 8mm | 10000 units |

DEVICE MARKING

- 2A3



SOT23-6



Top View

ZXMN2A03E6

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|----------------|-------------------|---------------------|
| Drain-Source Voltage | V_{DSS} | 20 | V |
| Gate Source Voltage | V_{GS} | ± 12 | V |
| Continuous Drain Current $V_{GS}=4.5V$; $T_A=25^\circ C$ (b) $V_{GS}=4.5V$; $T_A=70^\circ C$ (b) $V_{GS}=4.5V$; $T_A=25^\circ C$ (a) | I_D | 4.5 3.6 3.6 | A |
| Pulsed Drain Current (c) | I_{DM} | 16 | A |
| Continuous Source Current (Body Diode) (b) | I_S | 2.7 | A |
| Pulsed Source Current (Body Diode)(c) | I_{SM} | 16 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 1.1 8.8 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 1.7 13.6 | W mW/ $^\circ C$ |
| Operating and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ C$ |

THERMAL RESISTANCE

| PARAMETER | SYMBOL | VALUE | UNIT |
|-------------------------|-----------------|-------|--------------|
| Junction to Ambient (a) | $R_{\theta JA}$ | 113 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 73 | $^\circ C/W$ |

NOTES

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

(c) Repetitive rating 25mm x 25mm FR4 PCB, $D = 0.05$, pulse width 10 μs - pulse width limited by maximum junction temperature.

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ELECTRICAL CHARACTERISTICS (at $T_A = 25^\circ\text{C}$ unless otherwise stated).

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|----------------------|------|------|----------------|--------|--|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | 20 | | | V | I _D =250μA, V _{GS} =0V |
| Zero Gate Voltage Drain Current | I _{DSS} | | | 1 | μA | V _{DS} =20V, V _{GS} =0V |
| Gate-Body Leakage | I _{GSS} | | | 100 | nA | V _{GS} =±12V, V _{DS} =0V |
| Gate-Source Threshold Voltage | V _{GS(th)} | 0.7 | | | V | I _D =250μA, V _{DS} = V _{GS} |
| Static Drain-Source On-State Resistance (1) | R _{DS(on)} | | | 0.055 0.100 | Ω Ω | V _{GS} =4.5V, I _D =7.2A V _{GS} =2.5V, I _D =3.6A |
| Forward Transconductance (1)(3) | g _{fs} | | 12 | | S | V _{DS} =10V, I _D =7.2A |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C _{iss} | | 823 | | pF | V _{DS} =15 V, V _{GS} =0V, f=1MHz |
| Output Capacitance | C _{oss} | | 159 | | pF | |
| Reverse Transfer Capacitance | C _{rss} | | 93 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | t _{d(on)} | | 4.3 | | ns | V _{DD} =10V, I _D =3.5A R _G =6.0Ω, V _{GS} =5V |
| Rise Time | t _r | | 8.0 | | ns | |
| Turn-Off Delay Time | t _{d(off)} | | 17.7 | | ns | |
| Fall Time | t _f | | 10.0 | | ns | |
| Total Gate Charge | Q _g | | 8.6 | | nC | V _{DS} =10V, V _{GS} =4.5V, I _D =3.5A |
| Gate-Source Charge | Q _{gs} | | 1.9 | | nC | |
| Gate-Drain Charge | Q _{gd} | | 2.5 | | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V _{SD} | | 0.85 | 0.95 | V | T _J =25°C, I _S =4.2A, V _{GS} =0V |
| Reverse Recovery Time (3) | t _{rr} | | 14.2 | | ns | T _J =25°C, I _F =3.5A, di/dt= 100A/μs |
| Reverse Recovery Charge (3) | Q _{rr} | | 7.2 | | nC | |

NOTES

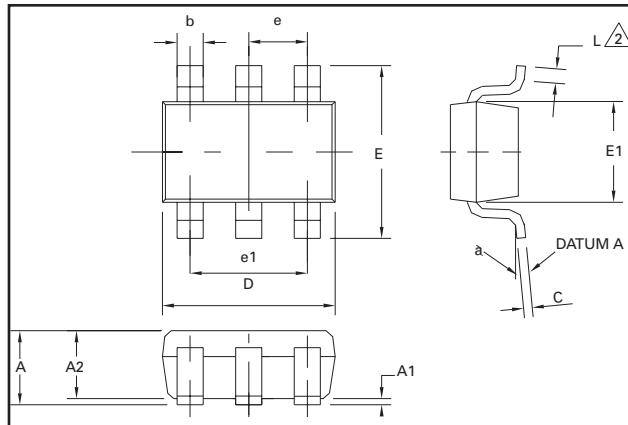
(1) Measured under pulsed conditions. Width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

(2) Switching characteristics are independent of operating junction temperature.

(3) For design aid only, not subject to production testing.

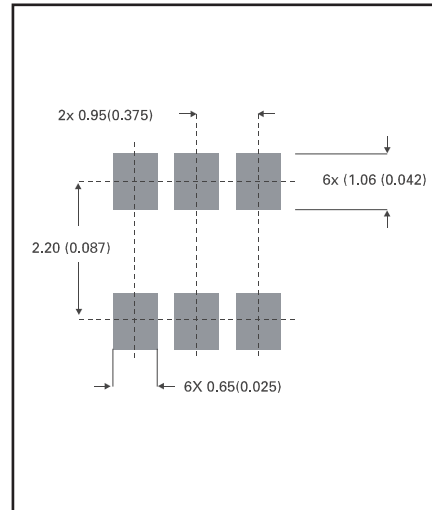
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PACKAGE DIMENSIONS



| DIM | Millimetres | | Inches | |
|-----|-------------|------|-----------|-------|
| | Min | Max | Min | Max |
| A | 0.90 | 1.45 | 0.35 | 0.057 |
| A1 | 0.00 | 0.15 | 0 | 0.006 |
| A2 | 0.90 | 1.30 | 0.035 | 0.051 |
| b | 0.35 | 0.50 | 0.014 | 0.019 |
| C | 0.09 | 0.20 | 0.0035 | 0.008 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 2.60 | 3.00 | 0.102 | 0.118 |
| E1 | 1.50 | 1.75 | 0.059 | 0.069 |
| L | 0.10 | 0.60 | 0.004 | 0.002 |
| e | 0.95 REF | | 0.037 REF | |
| e1 | 1.90 REF | | 0.074 REF | |
| L | 0° | 10° | 0° | 10° |

PAD LAYOUT DETAILS



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